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The Effects of Educational Environments Upon the Academic Achievement of Students Identified as Exceptional

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The Effects of Educational Environments Upon the Academic Achievement of Students Identified as Exceptional

(TITLE)

BY

Janet Y. Koch

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Abstract

The effect of classroom setting upon the academic achievement of students identified as exceptional is an issue worthy of exploration. A plethora of research data tends to show that segregated settings are more effective for individuals who are moderately to severely handicapped in intellectual or physical functioning, whereas integrated settings are more favorable toward those who are mildly handicapped (e.g., learning disabled or behavior disordered, for instance). Numerous variables in the different delivery systems make it rather difficult for the research to pinpoint which type of setting contributes best to a child's learning.

Research in the past has put considerable emphasis on the type of environmental setting. The quality of the setting is also important. Increasing the number of instructional strategies used in regular classrooms, resource rooms, or self-contained classrooms and developing models of learning so that individuals with exceptionalities can develop and function according to their potential in the mainstream of life is also worthy of attention. This scholarly paper reviews the literature and research specific to the aforementioned considerations.

The Effects of Educational Environments Upon the Academic Achievement of Students Identified as Exceptional

Public Law 94-142, the Education for All Handicapped Children Act of 1975, has provided opportunities, funding, and effort to be expended on behalf of individuals with exceptionalities in order to provide services commensurate with individual needs. The federal law states that public schools are required "to assure that, to the maximum extent appropriate, handicapped children . . . are educated with children who are not handicapped, and that special classes, separate schooling, or other removal of handicapped children from the regular educational environment occurs only when the nature or severity of the handicap is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily" (20 USC 1412, Sec. 612). This "least restrictive environment (LRE)" provision of PL 94-142 has presented challenges of magnitude to school systems charged with implementing the law. The law mandates that every child be provided an education that is appropriate for his needs, with an accompanying individual educational plan and at public expense.

Currently, according to the Office of Special Education and Rehabilitation Services (OSERS, 1985), approximately 4.3 million children, or 11 per cent of the nation's public school population,

receive special education services. This recent data indicates that 68 per cent of children with handicaps receive most of their education in regular classes, 25 per cent receive services in special classes in regular school facilities, and less than 7 per cent attend separate special schools (Singer et al., 1986). This population of students represents a diverse range of exceptionalities: Almost 70 per cent are classified as learning disabled or speech impaired, and the remainder fall into a varied range of categories including emotionally disturbed, mentally retarded, vision or hearing impaired, physically or multiply handicapped, or otherwise health impaired (Singer et al., 1986).

Since over a decade has elapsed since this federal legislation was enacted to benefit individuals with handicaps, and since federal expenditures usually demand accountability, it is almost mandatory that the impact of the law's effectiveness upon the academic achievement of these learners be examined. Have least restrictive environments been shown to be effective in the improvement of academic growth? Which type of setting--integrated or segregated--is more beneficial? The purpose of this investigation is to examine the effects of classroom or educational environment (whether it be regular, self-contained, or resource room arrangement) upon the academic achievement of learners classified as exceptional.

In order to accomplish this objective, it is necessary to look at past practices in the literature. Generally, the most common practices have been to either group homogeneously and place children with handicaps in separate settings, depending upon the severity of the handicap, or to retain the child in the regular class setting primarily, with outside supportive services given via a resource room (commonly known as "mainstreaming"). This second alternative has been considered to be more appropriate for learners with less severe handicaps. Therefore, it is important to know if setting itself exerts an influence upon academic achievement, if academic achievement is consistent across settings, or if it is a subtle power of other relevant variables such as the nature of the handicap, the curricula, the time allotted, the strategies used to individualize instruction, or most importantly, the instructor who facilitates the intervention. Associated with this issue is also an awareness of the continuum of service delivery from the most segregated plans to the most integrated plans, as modeled in pyramid formation by Dunn (1973).

Very little research was done prior to 1950 looking at the value of special classes and programs (Johnson, 1952). Bennett (1932) compared 50 children labeled mentally handicapped who had been enrolled in special classes for one year with an equal group enrolled in the regular grades. The mean achievement scores favored those who had

remained in the regular grades. Also notable was that the longer time spent in the special class did not result in increased achievement (Johnson, 1962). Still, educators thought that children with mild handicaps could be better served academically in smaller classes with specially trained teachers and uniquely designed materials. According to Johnson (1950), teachers with specialized assistance capabilities, specialized equipment, materials, facilities, and curricula not available to regular classrooms exhibited an effect upon the student's self-esteem and social development (Madden & Slavin, 1982). Pertsch paired two groups on the basis of chronological age, mental age, and IQ. After six months, he found that the group in the regular class showed greater gains academically than did the special class group. In motor skills there was no significant difference between groups. Previous studies (Ainsworth, 1959; Blatt, 1958) indicate that the special class for students labeled EMR showed few positive effects. The problem here is that the child who is identified as educable mentally retarded (EMR) cannot keep up with his "regular" peers, yet his intellectual level needs to be stimulated. Carroll (1967) sought to determine the effects of segregated and partially integrated school programs on both self-concept and academic achievement of students labeled EMR over one academic year. There was evidence to partially support the thesis that children in a segregated setting grew in academic achievement more than did children in a partially integrated setting (p. 99).

Dunn (1968) refers to efficacy studies by Kirk (1964), where results show consistently that students who are labeled EMR perform better in regular classroom settings than they do in specialized settings (p. 7). Further studies have been provided by Hoelke (1966) and Smith and Kennedy (1967) as well as Johnson (1962) to suggest that children labeled EMR progress acceptably when placed in an integrated setting. Labeling children as "rapid learners" was found to be positively reflected in teacher attitudes and eventually in the students' academic performance (Dunn, 1968, p. 9).

However, Hammons (1972) has noted that in response to Dunn's publication, many writers called for the total integration of all children with handicaps into the regular class (Christoplos & Renz, 1969), and for the special educator to assume the role of a teacher educator (Lilly, 1971). To counteract this supposition toward greater integration of service, Valletutti (1969) argued that integration is not viable unless the educational program suits those entering it. Another case for special classes for children identified as severely or profoundly retarded was advocated by Smith and Arkans (1974). They state that the special class is advantageous for children with more severe handicapping conditions, because most of these individuals have multiple handicaps and because the present physical arrangement of regular classes is not tailored to their needs. Therefore, it would appear that separate, special classes should remain an important component in

special education placement, because they clearly afford greater opportunity for more specialized, individualized, and small group instruction. However, more recent findings indicate that special classes have the disadvantages of having a heterogeneous composition of "dissimilar children" varying in both age and disability (Singer et al., 1985, p. 335). An age difference of three to four years was the norm, as were the distinct disability groups. In their study, Singer et al., (1985) found that three-quarters of the classes had at least one "emotionally disturbed or mentally retarded" student. This was in the context of large metropolitan school districts where it might be expected to find rather large numbers of students to permit a degree of homogeneous grouping.

Even though the research thusfar had shown unstable evidence, the letter and spirit of the federal mandate forged ahead, with an accompanying civil rights movement which sought individual rights for all citizens, regardless of ability (Madden & Slavin, 1982). Integration of different academic ability levels became part and parcel of educational life as was engineered to stop the practice of grouping homogeneously by "disability labels" (Dunn, 1968, 1973). Dunn's recommendations may very well have been instrumental in making educational environments less restrictive (Dunn, 1968), and to incorporate the concept called "mainstreaming" into educational practice.

According to the Council for Exceptional Children (1976), mainstreaming was designed to provide for the child's educational and related needs. The rationale for mainstreaming (based on the findings of Kaufman et al., 1975) is contingent upon research which fails to show that segregation results in better progress (cited in Mercer & Mercer, 1985). It is recognized that children labeled exceptional have needs widely differing in intensity and duration; that a continuum of educational settings appropriate for individual needs is necessary; that children who are exceptional should be educated with children who are non-exceptional; and that segregation of children labeled exceptional need only occur when the severity of their needs cannot be satisfied in an integrated setting (Mercer & Mercer, 1985).

Research done by Lieberman (1982)and Hundert (1982) indicates that the term "mainstreaming" does not necessarily coincide with the notion of "least restrictive environment" (cited in Mercer & Mercer, 1985, p. 21). Similarly, success is not necessarily guaranteed simply because a child receives "special" education or is receiving a certain model of service delivery (Roddy, 1983). Furthermore, Phipps (1982) and Lieberman (1982) declare that an evaluation of a child's special needs may not always correlate with a particular child's placement in a special education program (cited in Mercer & Mercer, 1985, p. 21). Mainstreaming is not without its criticisms, however. According to Cruickshank (1983), no

definitive research exists to show that one type of placement is less restrictive than others. He feels that most teachers are not properly equipped to serve the needs of students with handicaps. Since administrators do not fully understand the nature of the problem, teachers are not provided sufficient support. The success of the instructional plan and program specific to the student's needs lies in helping children to be meaningful participants in the learning process and to demonstrate concrete growth as a result. Sometimes a learner may be able to survive well in the regular class program to achieve academic success (Roddy, 1983).

Progression from the narrower to the wider end of the continuum of special services delivery accelerated as the states and local educational agencies (LEAs) were given power to enforce the "least restrictive" provision of the federal mandate. In other words, the pendulum was now swinging away from labels of disability and homogeneous groups and toward meeting students' individual needs. In this effort, Dunn (1968) proposed that special educators should assume roles of "diagnostic, clinical, remedial, resource room, itinerant and/or team teachers, consultants, and developers of instructional materials and prescriptions for effective teaching" (p. 11).

Thus, as a result of this fervor to favor the legal regulations, more children began to be served in what is known as a "resource" setting. In this discussion reference has been made to such service delivery settings as special class, regular classroom, and resource room as

placement options for children with special needs. At this juncture, it is well to review the types of such settings for instructional placement. According to Leinhardt & Pallay (1982), some of the most common configurations of settings are as follows: (See also appendix for models of environmental interactions.)

- Regular class setting - a heterogeneous self-contained classroom with no extra support.
- Self-contained setting - a homogeneous classroom in which weaker children are taught all of the academic subjects in smaller (10-15) classes by specially trained teachers and seldom interact with other "regular" students even in non-academic settings.
- Mainstreamed setting - a heterogeneous, self-contained classroom where the teacher receives extra support so as to work with one or two children identified as handicapped.
- Resource room setting - special education students are pulled out of a heterogeneous classroom and sent to a resource room for target remediation.
- Itinerant service setting - a heterogeneous classroom in which weaker children are to receive extra help in the classroom from a specialist or receive help from a teacher who is taught how to service their particular needs (p. 559).

Other nomenclatures such as special class, special support services, in-class assistance, and teacher consultation have also been mentioned as levels of service delivery along the typical continuum of program placement in special education. Lowenbraun and Affleck (1978) contend that these arrangements have rarely approached the ideal of least restrictiveness.

Previous research has presented a mixed message concerning the effectiveness of self-contained special classes versus resource rooms in educating students with special needs. Some studies have found that there are fewer advantages of self-contained placement over regular classroom placement, showing by comparison, inferior academic results (Goldstein et al., 1965; Roberts, 1975; Carlberg & Kavale, 1980; Madden & Slavin, 1982). Bruininks and Rynders (1971) cite research as being inconclusive. On the other hand, Daniels (19) advocates a self-contained class to enhance peer interactions and proper remediation of learning problems. He criticized mainstreaming as a total waste of time for a child who is reading substantially below grade level.

Educational statistics for 1968 indicate that the special class arrangements for children labeled mentally retarded has been most common (Simon & Grant, 1968, cited in Wallace & Kauffman, 1978), but the number of special classes for those with learning disabilities and behavior disorders has risen (Kirk, 1972; Singer et al., 1986). Typically, the children placed in special classes spent the entire day in a class with

other children who are similarly handicapped. The critics of this type of arrangement declare that this segregation has a detrimental effect upon the overall development of these children so placed (Hallahan & Kauffman, 1978). Research by Goldstein, Moss and Jordan (1965) and Stanton and Cassidy (1964) has shown that the disadvantages of isolation from peers who are normal and the fact of poor academic achievement have influenced non-placement in a special class (cited in Wallace & Kauffman, 1978). Contradictory to these claims, other research findings by Jordan and DeCharms (1959) and Kern and Pfaeffle (1962) have found that special class pupils exhibit superior social and emotional adjustment (cited in Wallace & Kauffman, 1978). Nevertheless, the weight of PL 94-142 concerning educating children with handicaps along with those who are not handicapped, tended to nullify the existence of many special classes.

As a result, the momentum to accommodate and accelerate the concept of "mainstreaming" gave rise to the notion of a resource room as an alternative to the self-contained class as a means of meeting individual student needs. Budoff (1972) advocated "flexible supporting systems to be further explored for serving individual needs" (cited in Beck, Lindsey & Frith, 1981). Weintraub (1972) reinforced the concept of the resource room as being a viable alternative for students with learning disabilities (cited in Ito, 1980). According to Hammill and Weiderholt (1972), the resource room has been described by Sabatino (1972) as a "renaissance in special education," or a kind of middle path between

the self-contained special class and its disbandment" (cited in Hawisher & Calhoun, 1978, p. 11). In addition, several researchers (Deno, 1970; Lerner, 1976; Reger, 1973; Sabatino, 1972; Weiderholt, 1974; Weiderholt, Hammill & Brown, 1978) applaud the resource room as being a "most promising alternative to segregated special class placement or regular class inclusion without supportive services" (cited in D'Alonzo & Mauser, 1979), and as a specific place with allotted time for instructional services tailored to meet individual student needs. Notwithstanding though, D'Alonzo (1979) does qualify that the resource room is not necessarily a panacea for every student classified as exceptional. He strongly stressed that the pupil's needs were of utmost importance over the program.

Numerous studies have demonstrated the benefits of the resource room. It has been applauded as interactive (Smith, 1975), a place for intensive instruction (Barsch, 1978), and also an effective setting to increase academic achievement (Chandler, 1981; Dade County, 1975; Pepe, 1974; Sabatino, 1971; Sindelair, 1978). The resource room has a slight advantage over the self-contained setting (Leinhardt & Pallay, 1982). However, some findings would challenge this claim with no significant academic difference attributed to resource room placement (Walker, 1974; Budoff & Gottlieb, 1976). In one case study (Edgerton & Edgerton, 1973), a noticeable gain was realized from self-contained to resource room placement (Leinhardt & Pallay, 1982, p. 562). This study has been

described as unusual because it contains an "extensive ethnographic description of children as they move from segregated to more integrated arrangements" and also because of the negative effect for special placement (p. 565).

Conversely, the resource room has been criticized (Balow, 1965; Silberberg & Silberberg, 1969) for failure to maintain the child's academic progress after remediation has occurred (cited in Ito, p. 287). The criterion for judging the resource room as worthy is its success in assisting learners with handicaps to remain a part of the educational mainstream, and the quality of instruction in that environment (Jenkins & Mayhall, 1973, p. 35). Considerations for resource rooms should be focused on meeting individual needs, and by reducing deficits in academic subjects and modifying maladaptive behaviors (Skiba et al., 1983). Furthermore, it should also be based on consistency, responsiveness to the learner, and it should be a place for continuous and objective feedback (Jenkins & Mayhall, 1973).

As a result, the resource room has been offered as a defendable setting for least restrictive alternative placement with the implication that the regular class must be adapted according to the needs of students with handicaps, with appropriate supports for the classroom teacher. Probably the resource room has had its greatest impact in meeting the needs of those labeled as mildly handicapped (in 1970 referred to as EMR, but today labeled as learning disabled, or some other category), but it has not been found to be a superior placement for students

who are moderately or severely mentally retarded. Another advantage of the resource room is its cost effectiveness over the self-contained special class. Consequently, this gives an economic rationale for the support of mainstreaming (Franklin & Sparkman, 1978).

Since the challenge and mandates have been instituted in special education programs, the natural outcome would be expected increases in academic achievement of learners who are exceptional. Fisher et al., (1980) found that high learning success rate in acquiring new skills correlates positively with student achievement and acts as a reinforcing influence upon further attempts to learn (cited in Skiba et al., 1983). Moreover, evidence in the literature shows that children in lower grade levels show more gains than those in higher grades (Finch, 1977, p. 5). In reading, Ito (1980) discovered that the group who received intervention the shortest length of time had the higher rate than those remaining longer in the resource room. There were no significant differences between chronological age groups, however, the testing phases varied significantly (pp. 322-323). The lingering issue of which is more effective--self-contained setting or resource room setting--is still one to be debated in terms of academic and social effects of mainstreaming. Several investigations (Bersoff et al., 1972; Bruininks, 1978; Bryan, 1974, 1976, 1972; Rust, Miller & Wilson, 1978; Ryckman, 1979; Sheare, 1978; Vogel, 1974) found there were too many uncertainties to draw conclusions (cited in Zigler & Muenchow, 1979).

The question as to whether the effects of mainstreamed instructional intervention in the resource room transfers to other educational environments also needs to be scrutinized. Research conducted by Anderson-Inman (1986) indicates that the effect called "transenvironmental programming" is highly dependent upon the instructional competence and behavioral consistency of teachers. Teachers are the agents which structure the classroom and curriculum materials to help students acquire skills efficiently and effectively. The use of student-centered transfer strategies (e.g., "student-requested pre-teaching, curriculum-specific transfer training, and self-monitoring checklists") was found to be appropriately effective for students with mild disabilities who were motivated to improve their own performance in the regular class (pp. 571-572).

Consistency of performance was further explored by Anderson-Inman (1987) with regard to the impact of setting upon student performance in a resource room versus the regular classroom. Results revealed that changing the setting alone had no pronounced effect upon academic achievement, but that the combined effect of changes in test materials and the test administrator did make a difference in the transfer of some skills across the settings (p. 9).

Other models of educational services have been contrasted--both the teacher consultant and resource room models, wherein performance gains were equivalent for both models (Miller & Sabatino, 1980). Interestingly, an example of a strong successful indirect model--the

Vermont Consulting Teacher Program--which utilized consulting teachers to assist and train regular teachers to work with children who were eligible for special education in the regular classroom, proved higher gains than a traditional special education program.

In an exhaustive review of restrictive educational settings' impact upon achievement, Leinhardt and Pallay (1982) proposed that "setting operates indirectly through instructional and affective processes," stating that "setting is a weak macro-variable in terms of its influence on student academic growth; that some positive processes may be slightly easier in certain settings and some negative aspects more prevalent in others; that least restrictive environment is to be desired if strong evidence to the contrary does not appear; that isolated settings disfavor students at the upper end of the lower 25th quartile. They proclaimed that LRE is justified both morally and ethically, not simply because academic growth is a benefit (p. 559).

In their model of setting effects (see model), Leinhardt and Pallay (1982) attribute student outcomes--both affective and academic--to result from entering behavior and affective and instructional variables, both of which have positive effects.

> The affective and instructional variables are influenced either by entering behavior or setting or both. Setting, in turn, is influenced by entering behavior, in that entering behavior is frequently what determines the type of setting to which the child will be assigned. As the figure indicates, negative selection most probably has a negative influence on the affective state of the child, whereas it can

> have either a positive or negative influence on important instructional features. Having a positive affective and instructional experience is positively associated with learning and affective growth (p. 560).

This entering behavior, also discussed by Ysseldyke (1979) as "initial learner characteristics," is a factor for discretionary caution because he contends that the knowledge of the cognitive abilities of students is incomplete (cited in Fuchs & Fuchs, 1986). The type of setting placement effects upon academic achievement seems to have been obscured by the vast amount of research (Bersoff et al., 1972; Sabatino, 1971; Spollen & Ballif, 1971; cited in Carlberg & Kavale, 1980). However some evidence was obtained that self-contained settings are preferred over mainstreamed settings for students labeled as EMR and for those programs which demand "tightly monitored behaviorist programs (Leinhardt & Pallay, 1982, p. 561). They also found that children considered "borderline" perform more poorly in segregated settings than do children who are closer to the median of the group receiving special services (p. 561). Notwithstanding, the salient differences seemed to lie in lowered expectations for performance, insufficiently trained special education personnel, inappropriate diagnosis, and fear of a labeling stigma (Beck, Lindsey, & Frith, 1981; Glass, 1983).

Because of the labyrinth of so many variables operating upon the issue of effectiveness, it has been extremely difficult to address workable interventions. Carlberg and Kavale (1980) conducted fifty efficacy studies through a process called meta-analysis which allows

for an "apples and oranges" comparison of numerous variables. These studies revealed no outstanding relationship among "size of treatment effect, type of treatment, and the variables descriptive of subjects." Only one prominent feature emerged--that related to the category of exceptionality. His findings suggest that there is no justification for children with low IQs (including those labeled slow learners and EMR) to be in special classes; some justification exists for placement of individuals with LD and BD/ED due to a positive gain academically and socially (p. 304).

As Tindal affirms, "differences across categories may mask specific treatment effectiveness" (p. 102). Even within categories, there is considerable controversy regarding the definition of the populations (Tindal, 1985, p. 102). Frequently the literature on the efficacy of special education has lumped those children classified as exceptional into "aggregate" groups with various linkages between such groups labeled mentally retarded, mentally retarded, emotionally disturbed, neurologically handicapped, reading disabled, those having perceptual problems, and learning disabled. Even though there are criteria for those identified as learning disabled (average or above average intelligence; weaknesses in specific learning processes, i.e. receptive, integrative, expressive; specific discrepancy between academic achievement and intellectual functioning; normal visual and auditory acuity; and not emotionally disturbed or educationally disadvantaged) (Beck, Lindsey, & Frith, 1981), there is extensive disagreement as to what

constitutes a learning disability (Tucker, Stevens & Ysseldyke, 1983; Glass, 1983; McNutt, 1986; Kavale & Forness, 1985). Lloyd (1984) claims that the controversy over classification is such that one cannot differentiate among the types of students dependably, thereby making assumptions that there are interactions between types of educational placements (e.g., resource or self-contained rooms) and types of students (e.g., normal-learning or learning disabled). He contends that special educators should not plan instruction on the basis of pupil categories, but upon variables (viz. pupil characteristics). He recommends an "aptitude treatment interaction" based on differentiation in instruction based on learner characteristics. Instruction must be adapted to different needs (pp. 7-8). However, Fuchs & Fuchs (1986) argue that educational programs should not be based on the initial diagnoses of learner characteristics, basing their findings upon the work of Ysseldyke (1979) because there is "incomplete conceptualization of students' cognitive abilities; because of inadequacies of the tests used (Salvia & Ysseldyke, 1981); because of the manner in which the tests are administered (Fuchs & Fuchs, 1986); and because of incomplete knowledge of learner and teacher characteristics, educational treatments and classroom environments (Ysseldyke, 1979) (p. 200). Rather, Fuchs and Fuchs (1986) offer an inductive approach to develop individualized educational programs. They claim that "systematic formative evaluation may be more tenable than ATI as a general strategy to develop individualized instruction programs"for pupils with handicaps for these reasons: It does not rely on the

initial diagnosis of student characteristics when the relation between students' abilities and educational treatments isn't fully conceptualized; its measurement procedures are technically adequate; it requires repeated measurement by classroom teachers in familiar classroom settings; and finally, it uses technically adequate measures which are accountable to the regulations of PL 94-142. Moreover, the use of systematic formative evaluation procedures within special education reliably increase academic achievement, and these effects are further edified when teachers also employ"behavior modification, data-evaluation rules, and graphed data displays (p. 200). Even though the process is time-consuming, Fuchs and Fuchs (1986) avow that it is worth additional teacher time. Now that computer software is available, it is possible to simplify the implementation of this procedure to determine effective individualized education programs.

The focus must always remain upon the children themselves, not on the disabilities which may impede their learning. Robert Frost, the famous poet, expresses the confusion of categorization so beautifully:

> The rose is a rose,
> And was always a rose.
> But the theory now goes
> That the apple's a rose,
> And the pear is, and so's
> The plum, I suppose.
> The dear only knows
> What will next prove a rose.
>
> --Robert Frost

Are there programs which have been effective relative to academic achievement for the children labeled learning disabled? Numerous examples of evaluations of LD programs have emerged during the late 1970s and early 1980s. One such evaluation in Janesville, Wisconsin (Balliet, 1983; Bersell & Balliet, 1981) demonstrated that above average standard score growth, most consistently with reading and spelling, occurred with approximately 15 per cent of this school district's students with learning disabilities over the past three years. Credit for these improvements appear to stem from a new reading series, direct teaching of spelling, and a newly piloted written expression curriculum in which growth is expected to continue.

Cox and Wilson (1981) investigated which was the most effective reading program structure over academic gains in students with learning disabilities. Three different settings (regular classroom with outside support; learning center; self-contained special classroom) were compared using 90 students. Students labeled LD gained significantly higher academically in reading achievement in the self-contained classroom than did students in the regular classroom with outside support from the learning specialist. The self-contained students also outperformed those in the learning center. Results from this study show that students identified as LD gained more reading progress from special placement than other instructional processes.

A rather comprehensive project called Systematic Instructional Management Strategies (SIMS) for grades K-4 employed management

strategies and a structured, sequenced curriculum to help teachers plan appropriate programs for students. One precision teaching model served to identify and remediate individuals with learning deficits through the use of measuring procedures based on direct, daily assessment. Evidence was analyzed that the program was effective among 19 experimental control group comparisons in 1973. In 1976 the follow-up study showed the experimental group still to be superior in 75 per cent of the variables as measured by the California Achievement Test, WRAT, and one-minute probes. SIMS students did better than non-SIMS students.

In a study that was done in the Skokie School District in 1979-1981 to evaluate special education programs and techniques, very little difference was demonstrated in the perceived goal progress between students enrolled in the resource program and those in the self-contained classroom (although the self-contained students were perceived to have made slightly greater goal progress). A look at the gain scores in relation to the type of service for the two separate years between 1979 and 1980 shows that students in the resource room realized slightly greater gains than those who were not; however, those self-contained students not mainstreamed did better than those who were mainstreamed.

A resource LD program in Dade County, Florida (1974-1975) tested a 10 per cent sample of students with the WRAT. Results for reading, spelling, and arithmetic subtests showed that the student labeled LD was gaining at one-half the rate expected of the "normal" student and

losing ground. In Edmonton (E.L.A.A.P., 1976-1977) those students with specific disabilities showed significant gains in basic reading and spelling skills, although still below grade level, were made in a small group tutorial setting (Finch, 1977).

A study by Chiang, Bertram and Schilling (1983) to determine the effectiveness of a speed spelling program implemented across two months for five students with learning disabilities in a resource room exhibited overall gains in both pre- and posttest scores with average gains two-and-one-half times that normally expected. Normal progress ensued even for the most-severe-student-with-LD subject three years behind in spelling. The program was attributed to: (1) a routine, exact set of behavior patterns; (2) students' awareness of timed performance as well as accuracy; (3) the use of performance graphs as motivators of the students toward mastery. However, the size of the sample was very small.

From the numerous research studies considered, the evidence still remains rather ambiguous as to which learning environment in special education provides the nurture for the most attractive academic achievement outcomes. In his exhaustive examination of special education effectiveness, Gerald Tindal (1985) has synthesized the research, critiqueing the methodology as having serious "flaws." Regarding the populations served, he asserts that "aggregation of such groups doesn't permit assessment of treatment effects on groups of children with similar problems" with poor definitions of the labels (p. 102).

Perhaps even the terms "achievement" and "learning" have been unclear in the literature. Cawley (1985) offers this clarification: "Achievement is a representation of the status of the individual at a given point in time. Learning is a representation of what it takes an individual to go from one point in time to another" (p. 49). Furthermore, learning is of prime importance when determining a service delivery option. The emphasis should be on "learning disability," not "achievement disability."

Another problem in the research has been inadequate sampling procedures. The most valid and reliable type of sampling, the random assignment, has been used least frequently. In 1965, Goldstein, Moss, and Jordan declared that "the biases in sample selection arising out of comparing children in existing special classes for the EMR with similar children in regular grades is serious enough in itself to question the results of the research that has been reported" (p. 13) (cited in Tindal, 1985). Too often matching on variables other than outcome measure--such as IQ, sex, age, and achievement levels--has been misleading (Campbell & Stanley, 1963, quoted in Tindal, 1985). Rather, equivalent groups need to be matched on well-defined lines. Nevertheless, only three studies have been conducted in which the students were matched on achievement (Franklin & Sparkman, 1978; Vacc, 1968; Walter, 1974, cited in Tindal, 1980). Yet another flaw has been found in very weak experimental designs, which have been used most often.

The strongest design, the pretest-posttest control group, in which subjects are randomly assigned to treatment control groups and tested twice, and which potentially controls for all eight sources of invalidity, has been used the least (Tindal, 1985). Typical in the literature are inappropriate comparisons: special and regular classes; self-contained and resource rooms; residential schools and regular or special classes; and performance prior to and following the special education treatment.

Frequently the literature either vaguely refers to or omits discussing the nature of the treatments offered in the special programs. Only a few studies (Budoff & Gottlieb, 1976; Haring & Krug, 1975; Idol-Maestas, Lloyd & Ritter, 1982) include a description of the major components (cited in Tindal, 1985).

The issue of technical adequacy of the outcome measures to measure effectiveness is of critical essence as well. Are the test items relevant to what is being measured? Especially reproving are Lovitt and Eaton (1972) who criticize the literature on efficacy on the grounds that no investigator has probed the relationship between the tests used to document effectiveness and the curriculum being evaluated (cited in Tindal, 1985). For example, Salvia and Ysseldyke (1985) protest the extensive use of the Wide Range Achievement Test (WRAT) as being unreliable and invalid. There is also evidence to show that there are differences in the manner in which outcome data is summarized and reported. As Shinn (1986) and Tindal, Shinn, and Germann (1987) have

revealed, the "interpretation of changes in student performance is not simply a matter of reporting scores. Rather, as hypothesized, the choice of a summary metric may well determine the types of conclusions that are made" (p. 25). Findings by Idol-Maestas, Lloyd and Ritter (1982) used a month-gain-per month metric which accounted for both pre- and post-performance scales in relation to the time the student was engaged in the intervention program. Tindal (1985) further states that there is questionable statistical conclusion validity in the metrics used. Furthermore, academic effectiveness is often linked with social outcomes, as considerable research shows (Dunn, 1968, Bersoff et al., 1972; Carlberg & Kavale, 1980; D'Alonzo et al., 1979; Chandler, 1981; Jenkins & Mayhall, 1973; Leinhardt & Pallay, 1982; Meyen & Lehr, 1980; Smith, 1975; Wiederholt, 1974; Madden & Slavin, 1982).

Often concern has been raised in the literature with reference to cognitive style or modality preference. Saracho (1984) found that cognitive style seemed to be important in the students' educational progress. However, recent findings demonstrated that little or no gain in achievement was realized when instructional methods were matched to preferred learning modality. Kavale & Forness (1987) stated that from their research, only modest improvement was exhibited for either auditory, visual, or kinesthetic teaching methods. Emphasis upon all modalities in the learning process is urged, however, and instruction needs to be based upon substance in instruction. Variance in the

instructional approach should be in accordance with the impairment severity of the students being taught (i.e. mildly versus severely learning disabled) (Thurlow, Ysseldyke, Graden, & Algozzine, 1984).

Since a multitude of factors are operative on this issue of effectiveness upon academic achievement, there must be some alternative solutions to overcome the myriad of methodological barriers. Sindelar and Deno (1978) made a significant statement with regard to ongoing planning and evaluation:

> Evaluations should be used to improve existing programs as well as to certify them as successful or not. In short, formative evaluation should be combined with summative evaluation in efficacy studies. In such an approach, initial program evaluation is followed by program revision; subsequent evaluations by subsequent revisions; and so on until successful programs are constructed (p. 26).

Such alternative strategies are designated as being instruments of formative evaluation: Responsive Teaching, Directive Teaching, Precision Teaching, Data Based Program Modification. Advantages of such procedures are: frequent measurement, graphic display of data, student feedback, and use of unique evaluation strategies (Tindal, 1985).

One alternative approach, entitled the Adaptive Learning Environments Model (ALEM) was demonstrated to be an effective means of accommodating a much wider range of differences across different settings with favorable student outcomes in the areas of reading and math for students K-3. The concentration in this model focused on a "systematic integration

of a wide range of practices" shown to be effective in such practical variables as: allocation and efficient use of teachers' and students' time; structure of classroom management; teachers' feedback and reinforcement to students; quality and pattern of teacher-student interactions; relationship between the diagnosed learning needs of the student and the nature of instructional intervention; and degree of flexibility in school structure for provision of classroom instruction that is tailored to student differences (Wang and Birch, 1984, p. 392).

In British Columbia (school districts of Langley and Coquitlam), a model called the Learning Assistance Model was developed to serve students labeled as learning disabled through consultative services to other school personnel and parents. These included minimum competencies in "first-line assessment, remedial and compensatory teaching techniques, and consultative skills needed for effective co-teaching"(McBride, 1986). The strategies engaged in this model include "communicating, assessing students, modelling, coaching, in-servicing, liaising/networking, conferencing, linking, researching, evaluating and selecting materials and encouraging" (Francis, 1986, p. 6).

A monumental work by Idol and West (1987) highlighting training and practice in consultation in special education, punctuates its importance and deployment if the teaching/learning process promises to be effective. They recommend the future use of a framework entitled "Seven Levels of Intensity of Intervention" which involves instruction,

curriculum, and program placement decisions for students who may need benefits accrued from services in special education. Stainback and Stainback (1984) have promoted the philosophy that both regular educators and special educators collaborate in their efforts to meet individual needs through a unified system of education rather than the current dual system. This combined effort would serve to strengthen all aspects of educating students with special needs.

Concern has been expressed in the literature that skills acquired in one setting may not generalize to other settings. Therefore, specific programming is recommended to promote the necessary transfer of skills from one environment to another or across settings. Named "transenvironmental programming" (referred to previously) (Anderson-Inman, 1986), this approach proposes to "improve performance in the target environment as a result of carefully programming the training environment" (p. 4). The four components of this process include: (1) identifying the skills necessary for regular class success; (2) providing instruction in the resource room to students lacking in targeted skills; (3) incorporating strategies to promote transfer of learned skills from the resource room to the regular class; (4) evaluating the effects of resource room instruction by monitoring student performance in the regular class (p. 4).

As educators, it behooves us as facilitators in the learning process to make the learning environment as least restrictive as possible (Cruickshank, 1977) and to promote rich program environments

with instructional alternatives, so that regular education is more "special" and special education is more unified (Stainback & Stainback, 1984).

Roddy (1983) offered the following tale in an effort to build bridges between the mainstream and special education:

> A long time ago, a king and queen reigned over a modest kingdom that was of moderate resources. They had one possession, however, that was very important to the royal family--a gem. Along the way, their gem suffered damage and was severely scratched. The king and queen were most upset with this occurrence and sought out the many resources available to them to remove the damage. Unfortunately, the wizards and magicians in the kingdom were frustrated in their failure to remove the laceration. Sadly, the damage was so severe that the gen's diffusion of light was most distracting. Realizing the reality of their loss, the king and queen were in despair and sought only to comfort each other and minimize the damage and their loss.
>
> The jester, after much thought, and many hours with the jewel, began to make further scratches on the face of the gem. At the top of the original cut, he fashioned the petals of a flower, and midway on the scratch made impressions of leaves and buds. Completing his task, he returned the stone to the family. Their outrage was predictable. "How dare you further scratch our jewel! We wanted the scratch and the damage removed."
>
> The jester stood erect, holding the stone in his hands to catch the magic of the light. "Your Highness, you and your wife sought out many specialists and exhausted your limited resources, in hopes of removing the defect. I have humbly changed the jewel so that when people view it they will see the image of a flower rather than

> the ugliness of the defect. I have attempted to change the scar so people will see it as a stem, a source of life, natural beauty, and potential. Sadly, Your Highness, the damage will be ever-present. I have only sought to change it in some way so people will see loveliness and beauty, rather than ugliness damage." (p. 7)

The issue specific to the effects of the classroom setting upon academic achievement is unresolved, having been overshadowed by many interactive variables and the inadequate methodology of studies designed to answer questions. From the research gleaned, it is apparent that the type of setting may indirectly affect the academic achievement outcomes of students with handicaps, but substantial research corroborates only nebulous effects. In essence, the focus rests upon the teacher, the student, their interactions, and the daily events <u>in</u> the learning process. Attention to what is transpiring within the classroom milieu enlightens the entire perspective. How knowledge is transmitted, the amount of time students spend actively engaged in learning tasks completed with a high degree of success, high expectations for quality of instruction, clear goals and objectives in the curriculum, close monitoring of the learning process, parent involvement, continual striving of both teachers and administrators toward effective instruction--are macro variables which affect academic outcomes--because the child is a whole person, not a figure of separate functions.

As the illustration of the jester and the gem reveals, those individuals with limited resources cannot be viewed as scratched or damaged, but as persons who reflect vari-colored prisms of light. All of these harmonizing in concert--the child, the setting, the teacher, the appropriate strategies, the curriculum materials--will play a vital role in the child's learning!

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